

## REMARKS

The drawings stand under objection for not including the reference symbol "20."

- 5 Applicants provide herewith a proposed revision to FIG. 1 including the reference numeral "20" in blue ink and including in blue ink a corresponding draftsman instruction note number 1.

The drawings further stand under objection for including the following reference signs not mentioned in the text of the specification: 6, 7B, 7C, 51, 52, 127, and 131.

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Applicants do not find a reference numeral "6" in the drawings. Applicants will appreciate a more specific identification of the figure or figures in which this reference sign of concern appears. Applicants do note use of a cross-sectional indicator, a "line 6-6" in FIG. 5 showing the location and orientation of the cross-section, i.e., cut line, for FIG. 6. This is mentioned in the Brief Description  
15 of the Drawings in connection with FIG. 6.

- The reference signs 7B and 7C refer to figure legends and are mentioned in the text of the application. Applicants are unaware of any other use of the reference signs "7B" and "7C." Applicants will appreciate a more specific identification of the figure or figures in which these  
20 reference sign of concern appear. Reference signs "7B" and "7C" also appear in FIG. 7A indicating the location and direction of cross-section, i.e., cut line, for FIGS. 7B and 7C, respectively.

- Applicants provide herewith in the above-mentioned proposed revision to FIG. 1 deletion of the reference numeral "51" and associated axis line as indicated by blue ink and as indicted in blue  
25 ink by corresponding draftsman instruction note number 2.

Reference numeral "52" appears at least twice in the specification, pages 6 and 10, according to applicants file copy, in reference to a "lateral axis 52."

Reference numeral "127" refers to a "scrub zone 127" and appears at page 10 of applicants' file copy.

Reference numeral "131" refers to "shielding" and appears at page 10 of applicants' file  
5 copy.

Should the Examiner be unable to find the reference signs where indicated, i.e., as mentioned by reference to applicants' file copy, applicant will be happy to further assist the Examiner in more precisely locating these references in the application as filed.

Should the Examiner find acceptable the proposed drawing change to FIG. 1, applicants will submit a replacement formal version of FIG. 1 including implementation of the changes indicated in blue ink and by draftsman instruction notes 1 and 2.

Accordingly the objection to the drawings can be removed.

Claims 1, 11, 22, 26-27, 31-33, 37-38, and 41-42 stand rejected under 35 USC Section 102(b) as allegedly anticipated by US Patent No. 5,041,846 to Vincent et al.

Claim 1 has been amended to call for a bi-furcated carriage and a bi-furcated heating element, first and second portions of the carriage carrying first and second portions of the heating element. Additional amendments to dependent claims 3, 6, and 13 correspond to changes in claim 1. Claim 12 is canceled.

Vincent et al show no such bi-furcated architecture.

Accordingly, the rejection of claim 1 and its dependent claim 11 as anticipated by Vincent under 35 USC Section 102 must be withdrawn.

Claim 22 has been amended to call for first and second synchronously scanning carriages and corresponding first and second heater elements in face-to-face opposition cooperative to produce radiant energy.

5 Vincent et al show no such architecture.

Accordingly, the rejection of claim 22 and its dependent claim 26 as anticipated by Vincent under 35 USC Section 102 must be withdrawn. Claim 23 is cancelled. Claims 24-26 are amended to conform to claim 27 as amended.

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Claim 27 has been amended to call for first and second synchronously scanning carriages and corresponding first and second heater elements in face-to-face opposition cooperative to produce radiant energy.

15 Vincent et al show no such architecture.

Accordingly, the rejection of claim 27 as anticipated by Vincent under 35 USC Section 102 must be withdrawn. Claim 28 is cancelled. Claims 29 and 30 are amended to conform to claim 27 as amended.

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Claim 31 has been amended to include cooperative first and second heating elements moving synchronously and in face-to-face relation to produce the heat zone. Claims 32, 34 and 36 are amended to conform to claim 31. Claims 33 and 35 are amended for proper form.

25 Vincent et al show no such architecture producing a heat zone by cooperative first and second heater elements.

Accordingly, the rejection of claim 31 and its dependent claims 32, 33, and 37 as anticipated by Vincent under 35 USC Section 102 must be withdrawn.

Claim 38 has been amended to include the means for applying heat energy being bifurcated and including cooperative first and second heater elements, the first heater element being positioned at a first side of the media and the second heater element being maintained at a second side of the media.

Vincent et al show no such architecture.

Accordingly, the rejection of claim 38 and its dependent claim 41 as anticipated by Vincent under 35 USC Section 102 must be withdrawn.

Claim 41 has been amended to include a bifurcated heating element including a first portion maintained at a first side of the print swath and a second portion maintained at a second side of the print swath in face-to-face opposition to the first portion

Vincent et al show no such architecture.

Accordingly, the rejection of claim 42 as anticipated by Vincent under 35 USC Section 102 must be withdrawn.

Vincent makes use of a convection heating element (col. 3 lines 52-55). The disclosed Vincent heater operates with a heater on one side of the media. The examiner proposes adding a second carriage to the system of Vincent, but Vincent finds no benefit from a second carriage. Given the form of heating element taught by Vincent, there exists no need for a second heater element component in face-to-face relation on an opposite side of the media. Under 35 USC Section 103, adding an unnecessary component cannot be taken as obvious.

Furthermore, Vincent teaches away from use of a second heater element. Vincent proposes a heated roller downstream as solution to further heating features. In fact, Vincent teaches that incomplete drying is good when followed by a roller-type heating device to reduce cockle.

5 Applicants respectfully traverse any combination of Vincent et al proposing a second carriage or a second heating element.

The Examiner proposes obviousness of a second carriage based on the Kupcho et al reference. In Kupcho et al., two printheads are located on opposing sides of the media, but the  
10 disclosure does not explicitly state that they travel together or be maintained in face-to-face relation on opposing side of the media.

Kupcho et al. do mention that the printhead printing surfaces "face one another" (column 7 lines 24-25), but not maintained in face-to-face relation. In fact, none of the drawings illustrate a  
15 face-to-face alignment of the printheads. All illustrations show an offset relationship between the opposing printheads, i.e., not in face-to-face relation. Any such opposing alignment is transitory as when the printheads pass one another when scanning across media. The specification fails entirely to mention that the illustrations differ from that of an intended usage, i.e., Kupcho et al. fail to explain why the drawings show an offset relationship between the opposing printheads. Further,  
20 given a decoupling between printing functions on each side, there exists no reason to tie together the two carriages for coordinated or face-to-face movement. An efficient use of the disclosed printing device would include independent movement. The circuitry illustrated in FIG. 5 of Kupcho shows separate driver and motor components for each printhead and carriage. Further, at column 10, lines 28-37, Kupcho has opportunity to mention CPU control with respect to carriage drive motors, but  
25 fails entirely to mention any coordinated movement or need for coordinated movement to maintain a direct- face-to-face opposing relation during operation.

In fact, at column 11, lines 54-57, Kupcho specifically touts the "independently controllable front and back page printheads..."

One fairly takes from the Kupcho disclosure a teaching of independently controlled printheads and independently positionable printheads on opposite sides of the media, but no need, motivation, or suggestion that such printheads move in unison and no need, motivation, or suggestion that such printheads be maintained in direct face-to-face relation or opposing face-to-face alignment.

To the contrary, Kupcho et al. clearly teach away from opposing printheads maintained in face-to-face relation across media or across a printzone.

Accordingly, the teachings of Kupcho et al. cannot under 35 USC Section 103(a) extent to support a proposed combination of printhead carriages maintained in face-to-face relation.

Given the various amendments calling for first and second carriages and first and second heater elements maintained in face-to-face relation, applicants respectfully submit that the prior art of record cannot support a 35 USC 103 rejection wherein Kupcho et al purportedly supports the obviousness of multiple carriages or multiple heater elements carried thereby.

Moving the separate and independent printheads of Kupcho et al in unison or face-to-face relation across the media frustrates this important objective of Kupcho et al and cannot be taken as an obvious extension of the Kupcho et al teachings as allowed under 35 USC Section 103.

For this reason, applicants respectfully submit that all obviousness rejections relying on Kupcho et al and proposing multiple carriages in face-to-face relation on opposing sides of media or a printzone must be withdrawn.

Claims 2-4, 10, 24, 29, 34-35, and 39 stand rejected as allegedly obvious in view of Vincent et al and Carreira et al. Each of claims 2-4, 10, 24, 29, 34-35, and 39 now carry recitation of first and second heater elements.

The form of microwave heater taught by Carreira et al is stationary and necessarily of width sufficient to receive the width of the media. Locating such a heater on a scanning carriage is unnecessary. Further, lateral or scanning movement of the Carreira et al heater if located on a carriage of the Vincent printer would require a printer of significantly greater width than that of the media. Generally, printers desirably have width corresponding to the width of media passing therethrough. Incorporating the Carreira et al heater onto a scanning carriage with a resulting printer width substantially greater than the media width is undesirable and therefore not an obvious modification of the Vincent et al printer architecture as allowed under 35 USC Section 103.

A stationary microwave heater cannot be simply mounted upon a printer carriage. Applicants respectfully submit that the Examiner must under 35 USC present a prima facie case of obviousness including teachings or motivations supporting modifications to the stationary microwave heater of Carreira et al as applied in the manner claimed by applicant herein.

Applicants have solved this problem through patentably inventive effort and request that the Examiner show such to the contrary as required through appropriate prior art teachings including all required suggestions and motivations necessary to complete the claimed invention.

In light of the amendment of claims 2-4, 10, 24, 29, 34-35, and 39, applicants respectfully submit that the Vincent et al printer cannot be modified as allowed under 35 USC Section 103 to include the heater of Carreira. Neither shows first and second carriages nor first and second heater elements as claimed.

Accordingly, the rejection of claims 2-4, 10, 24, 29, 34-35, and 39 as obvious in light of Vincent et al and Carreira et al must be withdrawn or, at minimum, a prima facie case of obviousness be formulated to allow applicant opportunity to properly respond.

Claims 5-7, 9, 25, 30, 36, 40 stand rejected under 35 USC Section 103 as allegedly obvious in light of Vincent et al and Woo et al.

These claims now carry in various forms recitation of multiple carriages, multiple heater elements, or synchronous movement thereof across opposing sides of the media. The proposed combination shows no such architecture and cannot support a 35 USC Section 103 rejection. It is not obvious to add a second carriage nor a second heater to the Vincent et al printer. The teachings of Woo add nothing to further this aspect of the claims as now amended.

Accordingly, the rejection of claims 5-7, 9, 25, 30, 36, 40 as allegedly obvious in light of Vincent et al and Woo et al. under 35 USC Section 103 must be withdrawn.

Claim 8 stands rejected under 35 USC Section 103 as allegedly obvious in light of Vincent et al and Richtsmeir et al.

Given the amendment to parent claim 1, the rejection must be withdrawn.

Claims 12-13, 23, and 28 stand rejected under 35 USC Section 103 as allegedly obvious in light of Vincent et al, Kupcho et al, and Carreira et al.

Again, applicants respectfully submit that the teachings of Vincent et al cannot be extended to include multiple heaters; the teachings of Kupcho et al cannot be extended to include face-to-face movement of the independent print heads; and the stationary microwave heater of Carreira cannot be modified under 35 USC Section 103 to be adapted for use as a scanning heater.

Accordingly, the rejection of claims 12-13, 23, and 28 as allegedly obvious in light of the combined teachings of Vincent et al, Kupcho et al, and Carreira et al. must be withdrawn.




Claims 14-21 stand rejected under 35 USC Section 103 as allegedly obvious in light of Kupcho et al and Carreira. As discussed above, an objective of the Kupcho et al disclosure is independent movement of the carriages to accomplish independent printing. Claim 14 has been amended to recite a face-to-face relation between the heater elements in opposition across the printzone. In other words, the claimed carriages do not move independently as required by Kupcho et al. Furthermore, as discussed above, the stationary microwave heater of Carreira et al cannot be modified in obvious fashion to operate as a scanning heater as claimed.

Accordingly, the rejection of claims 14-21 as allegedly obvious in light of the combined teachings of Kupcho et al and Carreira et al must be withdrawn

In light of the above, reconsideration and withdrawal of the outstanding rejections is respectfully requested.

Respectfully submitted,


  
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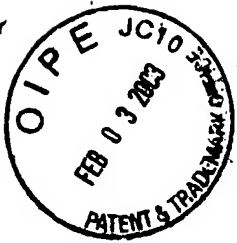
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I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the US Postal Service as First Class Mail, in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231, on the date indicated below.

Date

1-27-03

  
\_\_\_\_\_  
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MARKED VERSION OF ALL PENDING CLAIMS

U. S. Serial No.: 10/062,758 Art Unit: 2853  
Filing Date: 01/29/2002 Examiner: Liang, Leonard S.  
5 Inventor: Steven B. Elgee et al. Confirmation No.: 2415

Title: Scanning Carriage Heat Applicator  
Attorney Docket: 10013857-1

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Claims Document Log	
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1. (First Amended) An inkjet printing mechanism, comprising:

a media support which supports print media in a printzone;

a bi-furcated carriage which scans an inkjet printhead across the printzone,  
a first portion of said carriage located on a first side of said media when in said printzone,  
a second portion of said carriage being located on a second side of said media when in  
said printzone; and

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a bi-furcated heating element supported by the carriage, a first portion of  
said heating element being carried by said first portion of said carriage, a second portion  
of said heating element being carried by said second portion of said carriage, said first  
and second heater elements being maintained in face-to-face relation across said print  
zone.

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2. An inkjet printing mechanism according to claim 1 wherein said heating  
element comprises a microwave heating element.

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3. (First Amended) An inkjet printing mechanism according to claim 2 wherein  
said microwave heating element includes a bi-furcated waveguide spanning said first  
portion and said a second portion of said heating element and, defining a heat zone  
therebetween.

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4. An inkjet printing mechanism according to claim 3 wherein said heat zone  
scans synchronously with said carriage.

5. An inkjet printing mechanism according to claim 1 wherein said heating element comprises a radio frequency heating element.

5        6. (First Amended) An inkjet printing mechanism according to claim 5 wherein said radio frequency heating element includes as said first portion first electrodes and as said second portion second electrodes, a heat zone being positioned therebetween.

7. An inkjet printing mechanism according to claim 6 wherein said heat zone  
10 scans synchronously with said carriage.

8. An inkjet printing mechanism according to claim 1 further including a stationary blower producing an airflow directed at media when in the printzone.

15        9. An inkjet printing mechanism according to claim 1 wherein said heating element comprises a radio frequency applicator.

10. An inkjet printing mechanism according to claim 1 wherein said heating element comprises a microwave applicator.

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11. An inkjet printing mechanism according to claim 1 wherein said printhead directs ink droplets into said printzone and onto said media, and said heating element creates a heat zone at a surface of said media.

25        ~~12. An inkjet printing mechanism according to claim 1 further comprising a second scanning carriage, wherein said heating element has first and second portions each supported by said first carriage and said second carriage, respectively.~~

13. (First Amended) An inkjet printing mechanism according to claim 12  
30 wherein said first and second heating element portions define a gap therebetween, said gap comprising a heat zone generated by said heating element.

14. (First Amended) An inkjet printing mechanism comprising:  
a printzone;

a first carriage located on a first side of said printzone, said first carriage supporting an inkjet printhead and a first heater element portion; and

a second carriage located on a second side of said printzone, said second carriage holding a second heater element portion, said first and second heater element portions forming a heater element and being maintained in face-to-face opposition across said printzone.

15. An inkjet printing mechanism according to claim 14 wherein print media in the printzone has a print surface exposed to the printhead to receive ink therefrom, and  
10 has an opposing surface opposite the print surface.

16. An inkjet printing mechanism according to claim 15 wherein said first side of said printzone faces the media print surface and wherein said second side of said printzone faces the media opposing surface.

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17. An inkjet printing mechanism according to claim 14 wherein said inkjet printhead projects ink droplets into said printzone as print imaging on media when in said printzone, said print imaging receiving heat energy from said heater element.

20 18. An inkjet printing mechanism according to claim 14 wherein said first heater element portion comprises a microwave energy source and a first portion of a waveguide; said second heater element portion comprises a microwave load and a second portion of a waveguide;

said first and second waveguide portions together forming a waveguide  
25 directing microwave energy from said source to said load; and  
said printzone occupies space between said first portion of said waveguide and said second portion of said waveguide.

19. An inkjet printing mechanism according to claim 14 wherein said first and  
30 second heater element portions cooperatively form a microwave applicator.

20. An inkjet printing mechanism according to claim 14 wherein said printing mechanism synchronously scans said first carriage and said second carriage to maintain a selected alignment therebetween.

21. An inkjet printing mechanism according to claim 20 wherein said heating element is a microwave heating element, with at least one of said first carriage and said second carriage holding a microwave load and the other one of said first carriage and said second carriage supporting a microwave source.

22. (First Amended) A method of applying print imaging by ink droplet deposition on media and drying said print imaging, the method comprising the steps:  
reciprocating a first carriage across a printzone;  
projecting from said first carriage ink droplets as said print imaging; ~~and~~  
~~projecting from a first heater element on said first carriage radiant~~  
energy applied as heat energy to said media; and  
synchronously scanning a second carriage relative to said first carriage,  
said second carriage holding a second heater element cooperative with said first  
heater element to generate and apply said heat energy to said media, said first and  
second carriage being maintained in face-to-face relation with said media  
interposed therebetween.

~~23. A method according to claim 22 wherein said method comprises the step of~~  
~~synchronously scanning a second carriage relative to said first carriage, said second~~  
~~carriage holding a heater element cooperative with said heater on said first carriage to~~  
~~apply said heat energy to said media.~~

24. (First Amended) A method according to claim 22 wherein said first and  
second heater is elements comprise a microwave heater.

25. (First Amended) A method according to claim 22 wherein said first and  
second heater is elements comprise an RF heater.

26. (First Amended) A method according to claim 22 ~~wherein said placing step~~  
~~comprises~~ further comprising controllably advancing media in a feed direction through  
said printzone.

27. (First Amended) A printing method, comprising:

placing media in a printzone for print imaging;  
reciprocating a first carriage across said printzone;  
projecting from said first carriage ink droplets as said print imaging; and  
projecting from a first heater element on said first carriage radiant energy  
5 applied as heat energy to said media; and  
synchronously scanning a second carriage relative to said first  
mentioned carriage, said second carriage holding a heater element cooperative  
with said heater on said first carriage to apply said heat energy to said media, said  
first and second carriage being maintained in face-to-face relation with said media  
10 interposed therebetween.

~~28. A method according to claim 27 wherein said method includes synchronously  
scanning a second carriage relative to said first mentioned carriage, said second carriage  
15 holding a heater element cooperative with said heater on said first carriage to apply said  
heat energy to said media.~~

29. (First Amended) A method according to claim 27 wherein said first and  
second heater iselements comprise a microwave heater.

20 30. (First Amended) A method according to claim 27 wherein said first and  
second heater iselements comprise an RF heater.

31. (First Amended) A printing method, comprising:  
25 applying ink having an evaporatable component to a print media; and  
thereafter, moving a heat zone across said media to accelerate evaporation  
of said evaporatable component, said heat zone being generated by cooperative  
first and second heating elements moving synchronously and relative to said print  
media and cooperative to produce said heat zone, said first and second heating  
30 elements being maintained in face-to-face relation with said print media  
interposed therebetween.

32. (First Amended) A method according to claim 31 wherein said moving comprises ~~ing~~ scanning a said first and second heating elements across said print media.

5 33. (First Amended) A method according to claim 31 wherein said applying comprises ~~ing~~ scanning a printhead across said media.

34. (First Amended) A method according to claim 31 further comprising generating said heat zone using microwave heating produced cooperative by said first and second heating elements.

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35. (First Amended) A method according to claim 31 further comprising generating said heat zone ~~from~~ at opposing surfaces of said media.

36. (First Amended) A method according to claim 31 further comprising  
15 generating said heat zone from RF heating produced cooperative by said first and second heating elements.

37. A method according to claim 31 further comprising advancing said media through said printzone between each of a series of said applying and said moving.

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38. (First Amended) An inkjet printing mechanism comprising:  
means for reciprocating a carriage relative to a printzone;  
printing means for applying print imaging to media in said printzone and supported by said carriage means; and  
25 means for applying heat energy to said media and supported by said carriage means, said means for applying heat energy being bifurcated and including cooperative first and second heater elements, said first heater element being positioned at a first side of said media and said second heater element being maintained in face-to-face opposition therewith at a second side of said media.

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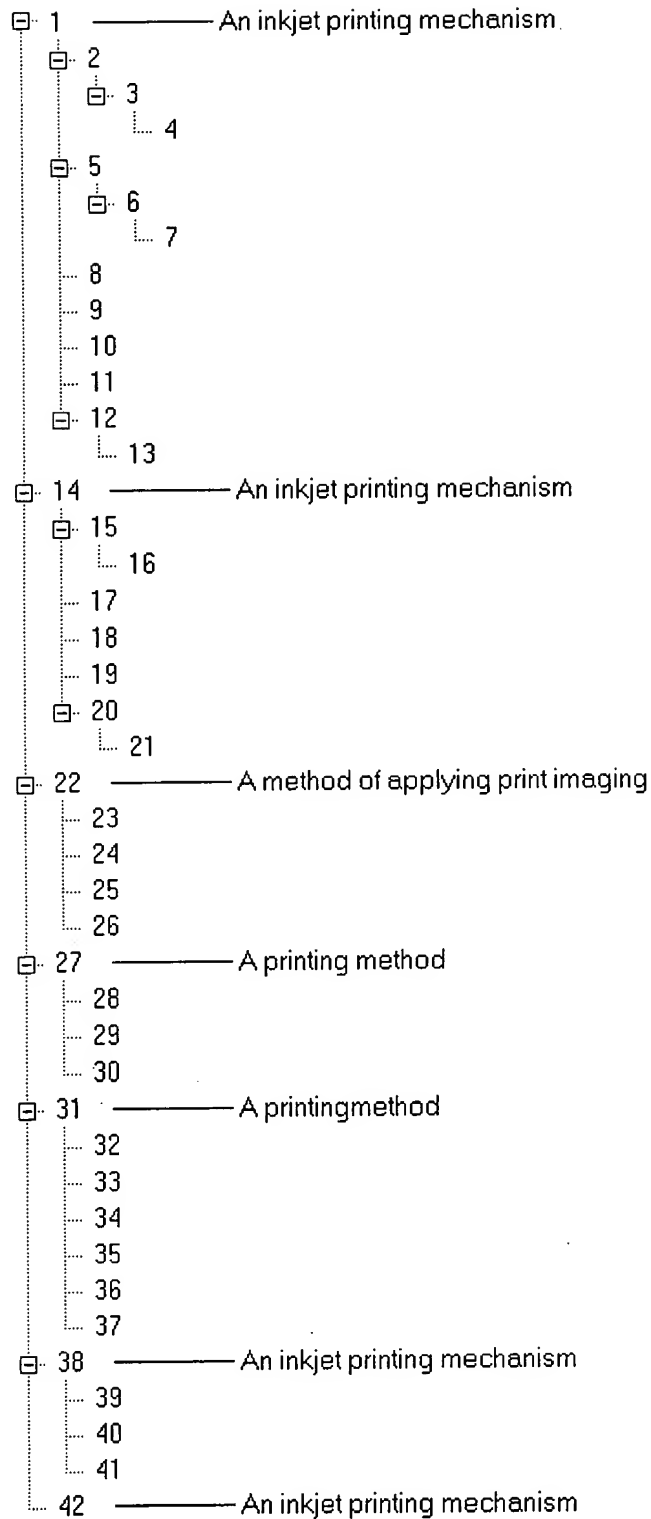
39. An inkjet printing mechanism according to claim 38 wherein said means for applying heat energy comprises a microwave energy source.

40. An inkjet printing mechanism according to claim 38 wherein said means for applying heat energy comprises an RF energy source.

41. An inkjet printing mechanism according to claim 38 wherein said printing  
5 means comprises an inkjet printing device projecting ink droplets therefrom.

42. (First Amended) An inkjet printing mechanism comprising:  
a reciprocating printing device projecting ink droplets therefrom along a  
print swath, said print swath having a print swath height; and  
10 a reciprocating bifurcated heating element projecting energy therefrom and  
applied as heat energy to media adjacent thereto along a heat swath height, said heat  
swath height being greater than said print swath height whereby print imaging produced  
by said ink droplets receives said heat energy through at least a first and second  
reciprocation of said heating element, said bifurcated heating element including a first  
15 portion maintained at a first side of said print swath and a second portion maintained at a  
second side of said print swath in face-to-face opposition to said first portion.





Claim Tree for 10062758